



Determine what type of investor you are and match a plan to your goals.

The type of plan that best suits you depends on the type of investor you are--your Personal Investor Profile. Are you an aggressive investor, a conservative investor or some where in between? We've designed this questionnaire to help you find out quickly and easily. By answering these questions, you can combine 1) the time period you want to consider for investing, your "time horizon," and 2) how you feel about the risks of investing, your "risk tolerance," to define your investor profile.

Once you decide which Personal Investor Profile best describes you, it's easy to choose the best way to allocate your assets and diversify your portfolio to meet your goals.

The questionnaire assumes that the money you plan to invest will be used for a long-term purpose such as retirement or a single purpose such as saving for a home. Read it over and check the answers that apply to you. Then follow the instructions to select an asset allocation plan.

1 I plan to begin withdrawing money from my investments for major needs within:

Less than 3 years	1 points
3-5 years	3 points
6-10 years	7 points
11 years or more	10 points
	_____ points

2 Once I begin withdrawing funds from my investments, I plan to spend all of the funds within:

Less than 2 years	0 points
2-5 years	1 points
6-10 years	4 points
11 years or more	8 points
	_____ points

SUBTOTAL A

Add your points from questions 1 and 2 and enter here _____

If your score is *less than 3*, STOP HERE.

A score of less than 3 indicates a very short investment time horizon. For such a short time horizon, a relatively low-risk portfolio of 40% short-term (average maturity of five years or less) bonds or bond funds and 60% cash is recommended, as stock investments may be significantly more volatile in the short term. Go directly to the short-term asset allocation chart.

If your score is *greater than 3*, please continue.

FIG. 1A

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(3) I would describe my knowledge of investments as:

None.....	0 points
Limited.....	2 points
Good.....	4 points
Extensive.....	6 points
	_____ points

(4) When I decide how to invest my money, I am:

Most concerned about the possibility of my investment losing value	0 points
Equally concerned about the possibility of my investment losing or gaining value.....	4 points
Most concerned about the possibility of my investment gaining value.....	8 points
	_____ points

(5) Review the following list and select the investments you currently own or have owned in the past. Then choose the one with the highest number of points and enter that number.

(Example: You now own stock funds and have in the past purchased international securities. Your score would be 8.)

Money market funds or cash equivalents..	0 points
Bonds and/or bond funds.....	3 points
Stocks and/or stock funds.....	6 points
International securities and/or international funds.....	8 points
(Maximum possible score = 8)	_____ points

(6) Consider this scenario:

Imagine that over the past three months, the overall stock market lost 25% of its value. An individual stock investment you own also lost 25% of its value. What would you do?

I would:

Sell all of my shares.....	0 points
Sell some of my shares.....	2 points
Do nothing.....	5 points
Buy more shares.....	8 points
	_____ points

(7) Review the following chart:

We've outlined the most likely best and worst case annual returns of five hypothetical investment plans. Which range of possible outcomes is most acceptable to you or best suits your investment philosophy?

(The figures are hypothetical and do not represent the performance of any particular investment.)

FIG. 1B

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Investment Plans	Avg. Annualized Return (1 year)	Best Case Scenario (1 year)	Worst Case Scenario (1 year)	Points
Investment Plan A	7.2%	16.3%	-5.6%	0 points
Investment Plan B	9.0%	25.0%	-12.1%	3 points
Investment Plan C	10.4%	33.6%	-18.2%	6 points
Investment Plan D	11.7%	42.8%	-24.0%	8 points
Investment Plan E	12.5%	50.0%	-28.2%	10 points

_____ points

► SUBTOTAL B

Add your points for questions 3 through 7 and enter here _____

Now you're ready to determine your Personal Investor Profile and choose a corresponding asset allocation plan.

①

Enter SUBTOTAL A here _____

This number represents your TIME HORIZON score.

Enter SUBTOTAL B here _____

This number represents your RISK TOLERANCE score.

②

Plot your TIME HORIZON score and your RISK TOLERANCE score on the Personal Investor Profile chart and locate their intersection point. Then find the corresponding asset allocation plan on the following page.

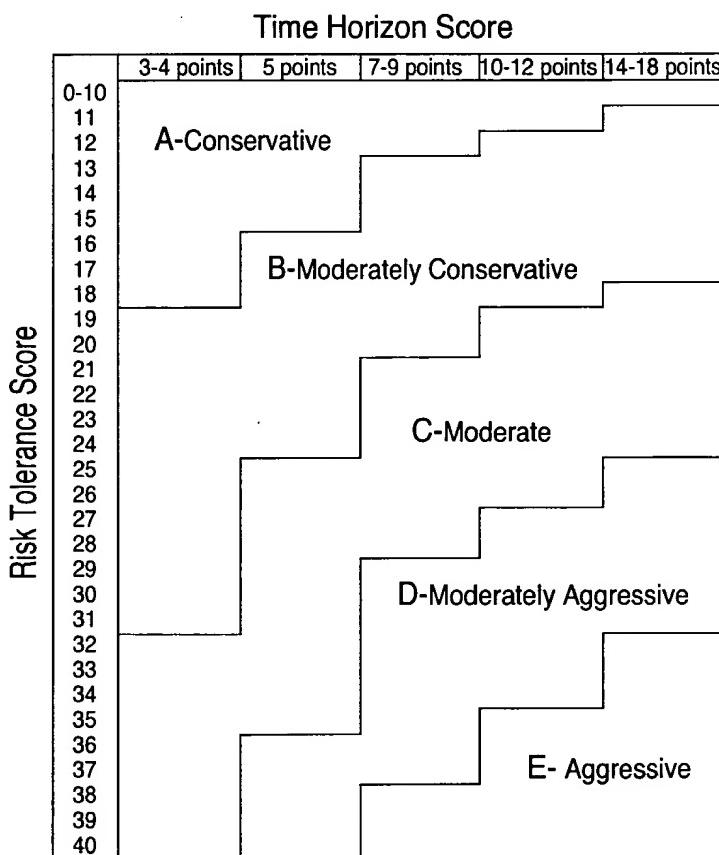


FIG. 1C

Now find your corresponding asset allocation plan.

The following allocation plans match the Personal Investor Profiles on the previous page-- A through E. Now that you know your own profile, go to the corresponding chart below to determine how to allocate your assets. Then go to Step 2 to choose a solution that suits your plan.

Short term

For investors who want current income and a high degree of stability in their investments. Given a short-term time horizon, it is prudent to invest in asset classes that experience relatively minor price fluctuations, such as short-term fixed-income funds and money market funds.

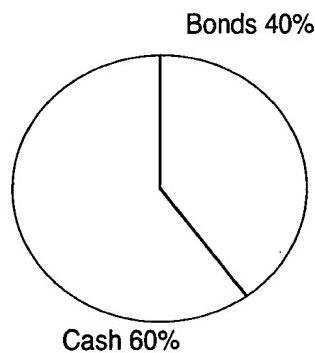


FIG. 2

(A) Conservative

Average annual return (1970-1996): 9.44%
Best year: 21.81%
Worst year: -1.25%

For investors who want current income and stability and aren't concerned about increasing the value of their investments.

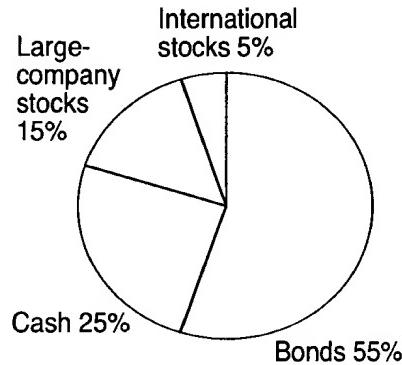


FIG. 2A

(B) Moderately Conservative

Average annual return (1970-1996): 10.65%
Best year: 25.57%
Worst year: -6.54%

For investors who want current income and stability, with some increase in the value of their investments.

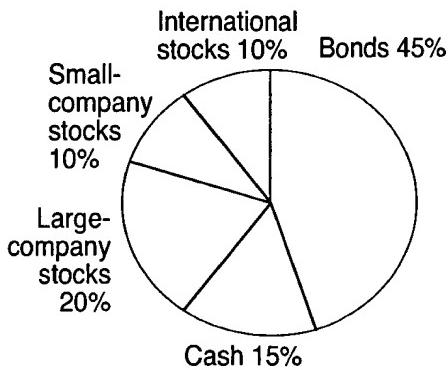


FIG. 2B

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FIG. 2C

(C) Moderate

Average annual return
(1970-1996): 11.55%
Best year: 29.76%
Worst year: -12.95%

For long-term investors who
don't need current income
and want reasonable but
stable growth. Some
fluctuations are tolerable,
but they want less risk than
the overall stock market.

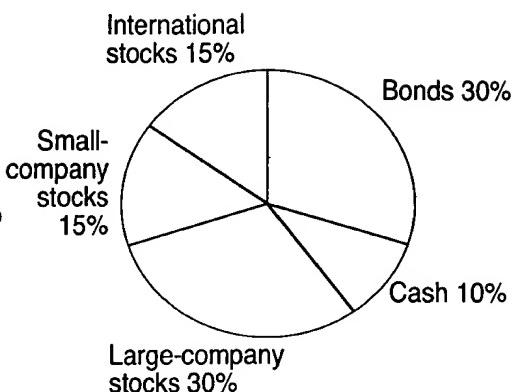


FIG. 2D

(D) Moderately Aggressive

Average annual return
(1970-1996): 12.41%
Best year: 36.63%
Worst year: -19.14%

For long-term investors who
want good growth and don't
need current income. A fair
amount of risk is acceptable,
but not as much as if they
invested exclusively in stocks.

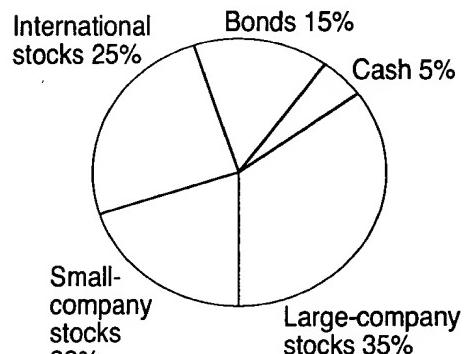
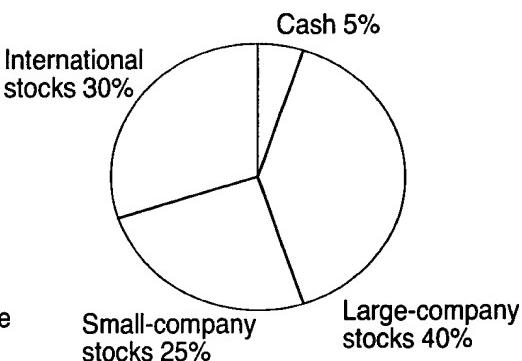


FIG. 2E

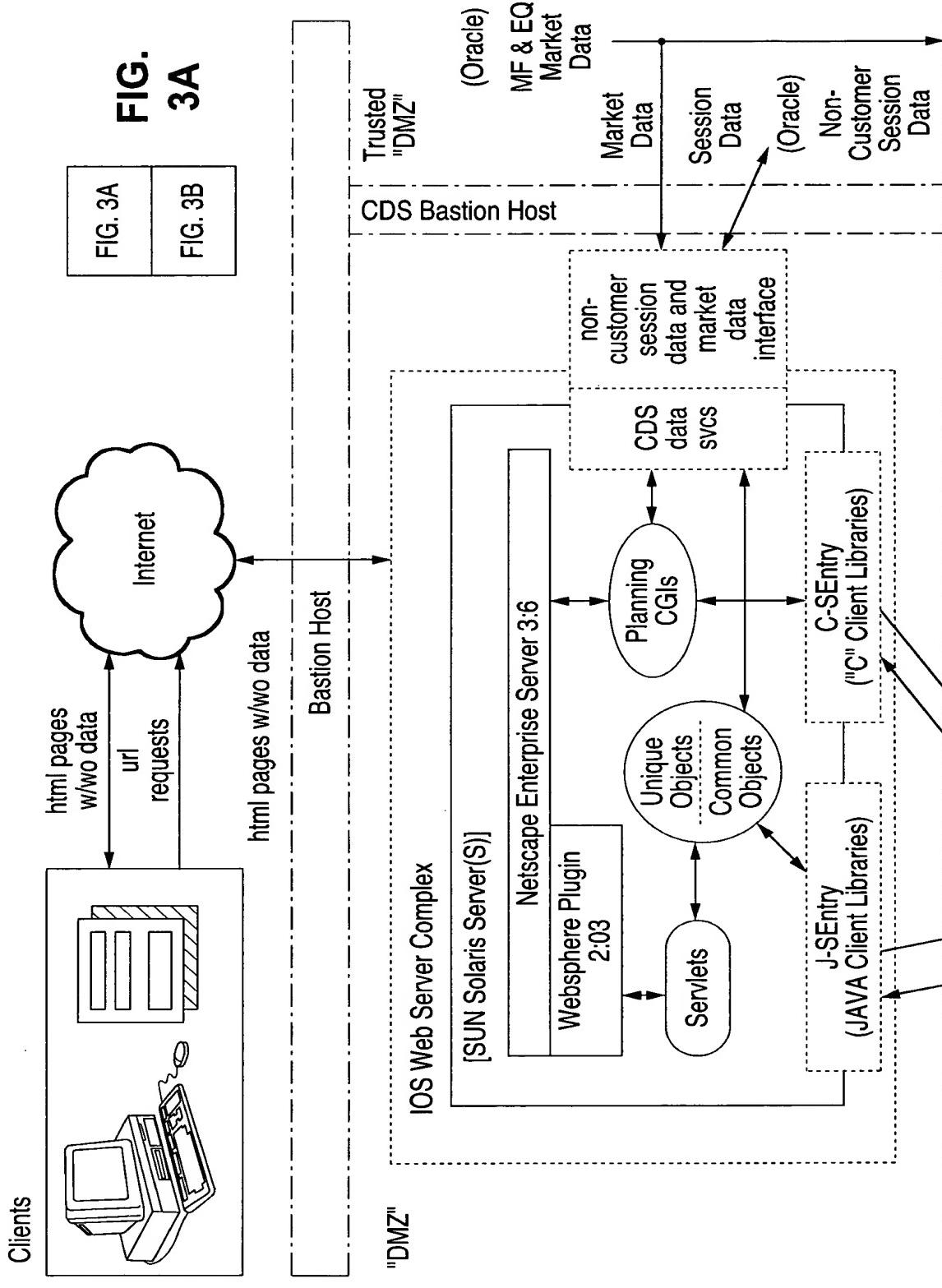
(E) Aggressive

Average annual return
(1970-1996): 12.89%
Best year: 42.39%
Worst year: -23.82%

For long-term investors who
want high growth and don't
need current income.
Substantial year-to-year
volatility in value is acceptable
in exchange for a potentially
high long-term return.



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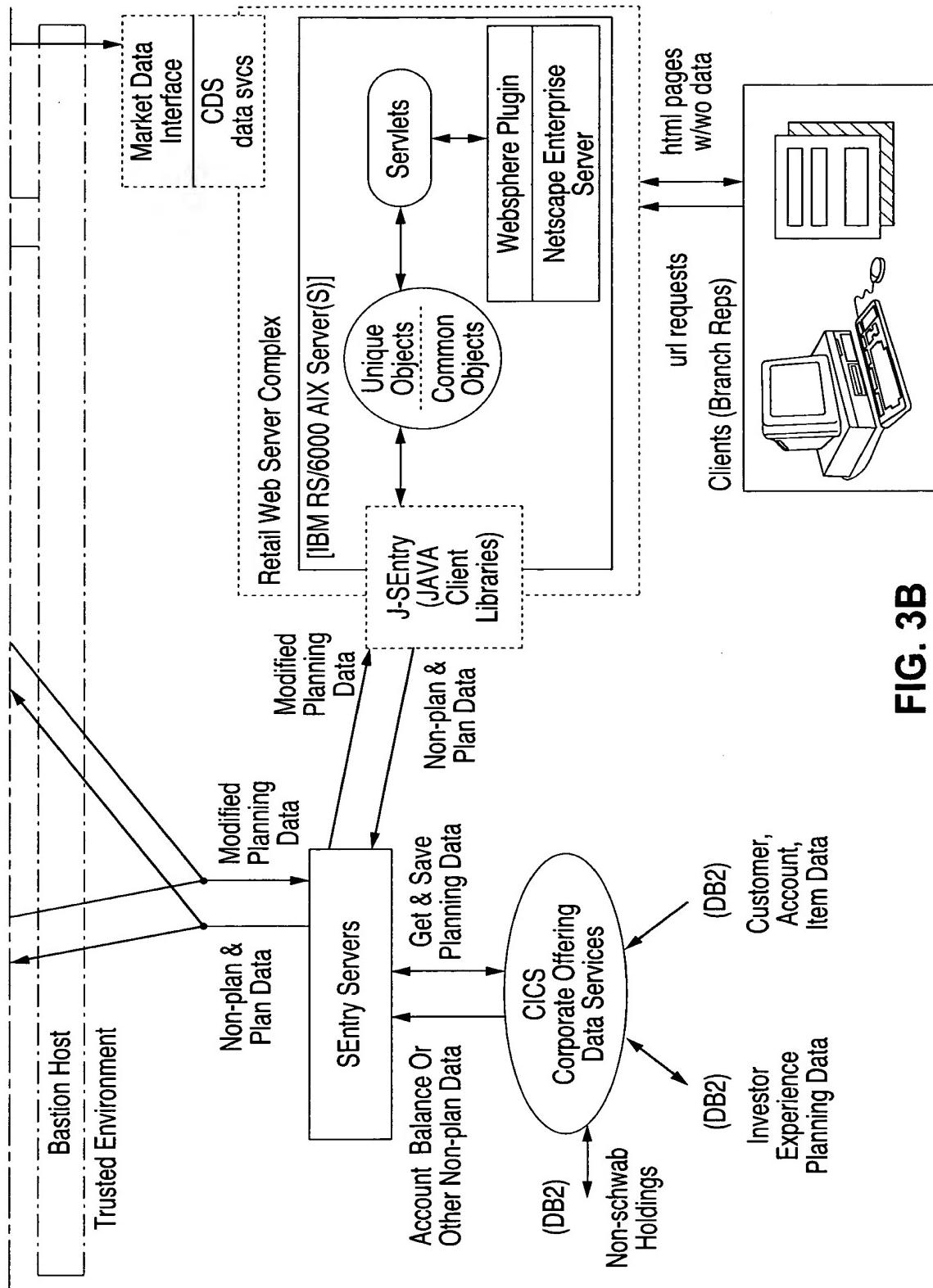


FIG. 3B

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1.13 High-Level Application Environment
Portfolio Optimizer
High-Level Application Environment

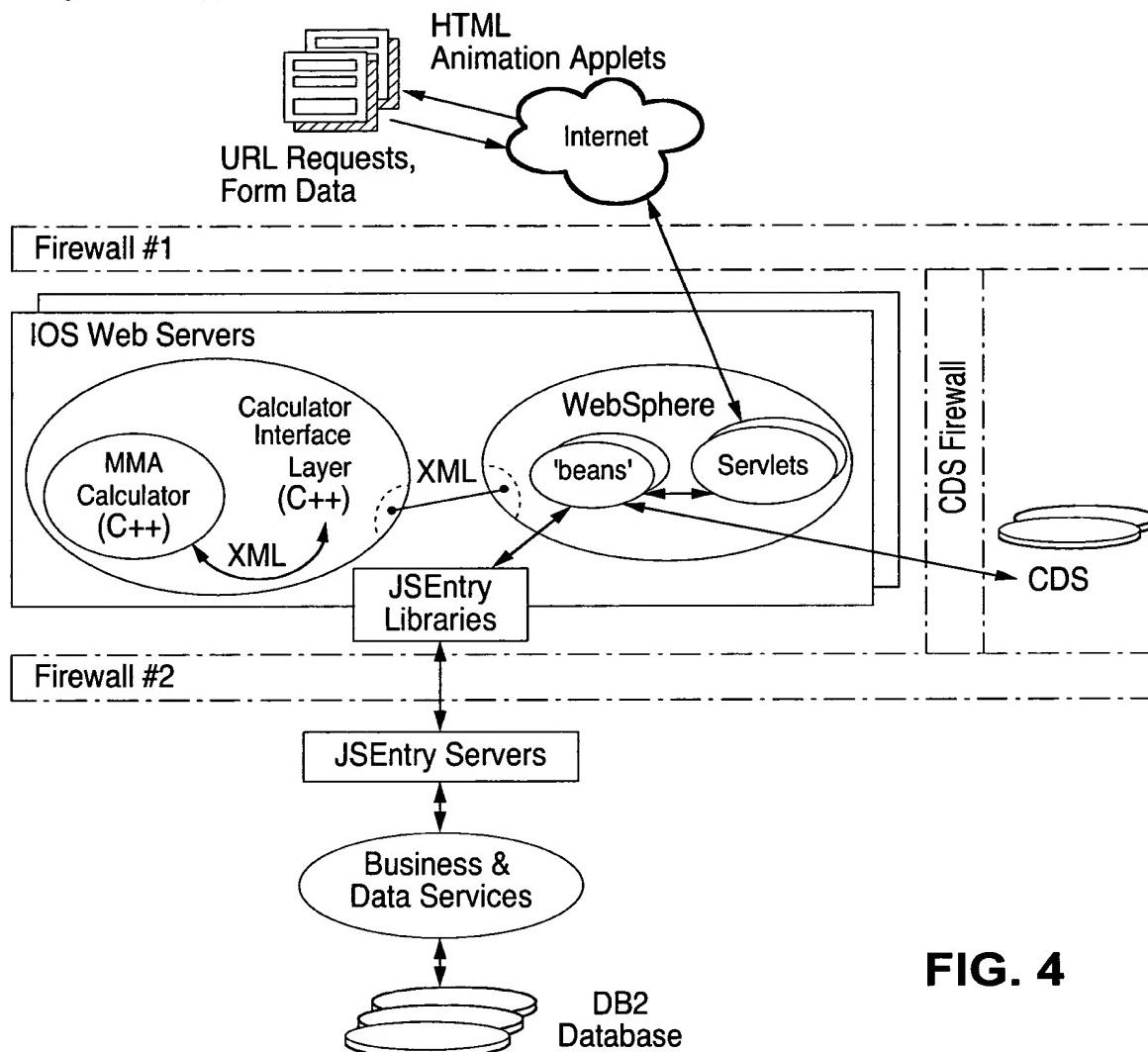


FIG. 4

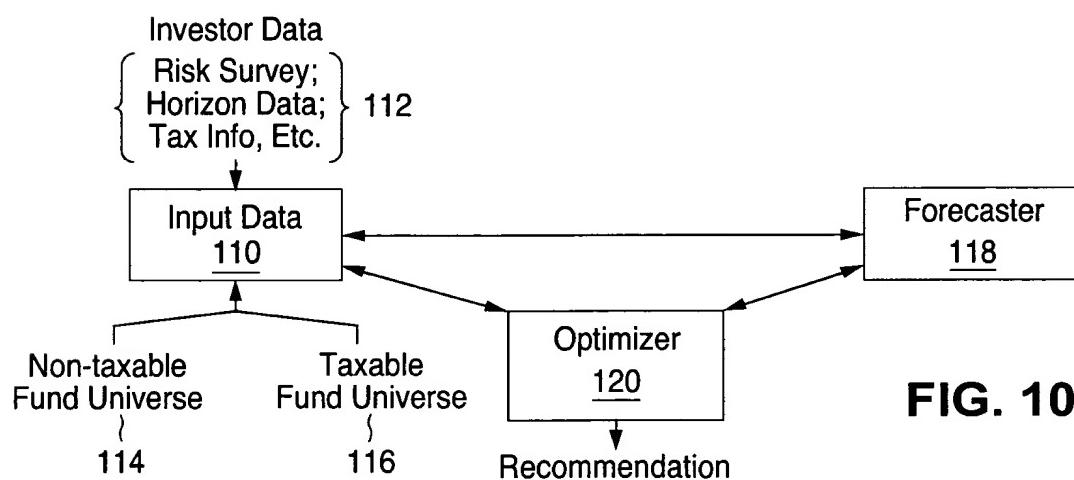


FIG. 10

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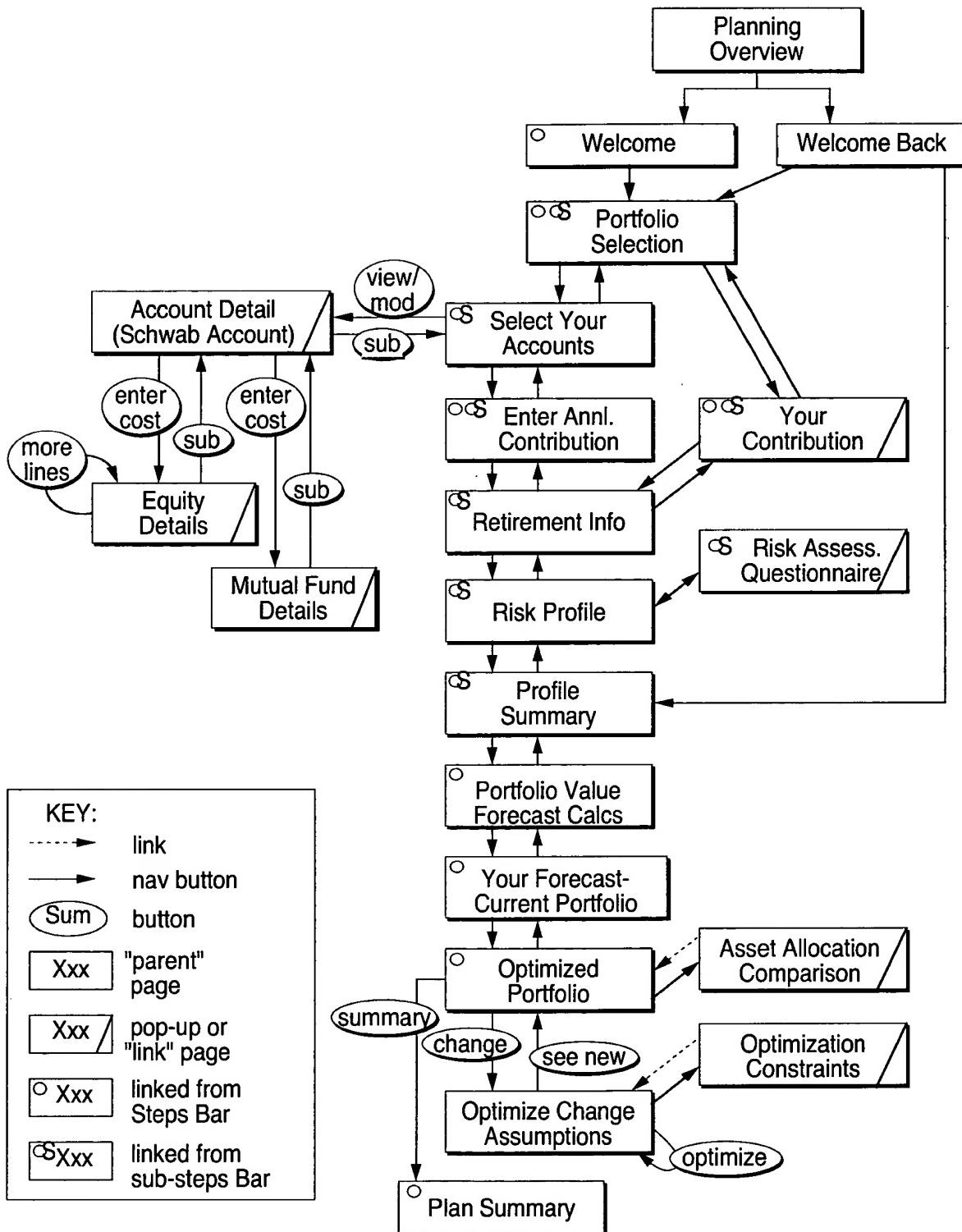
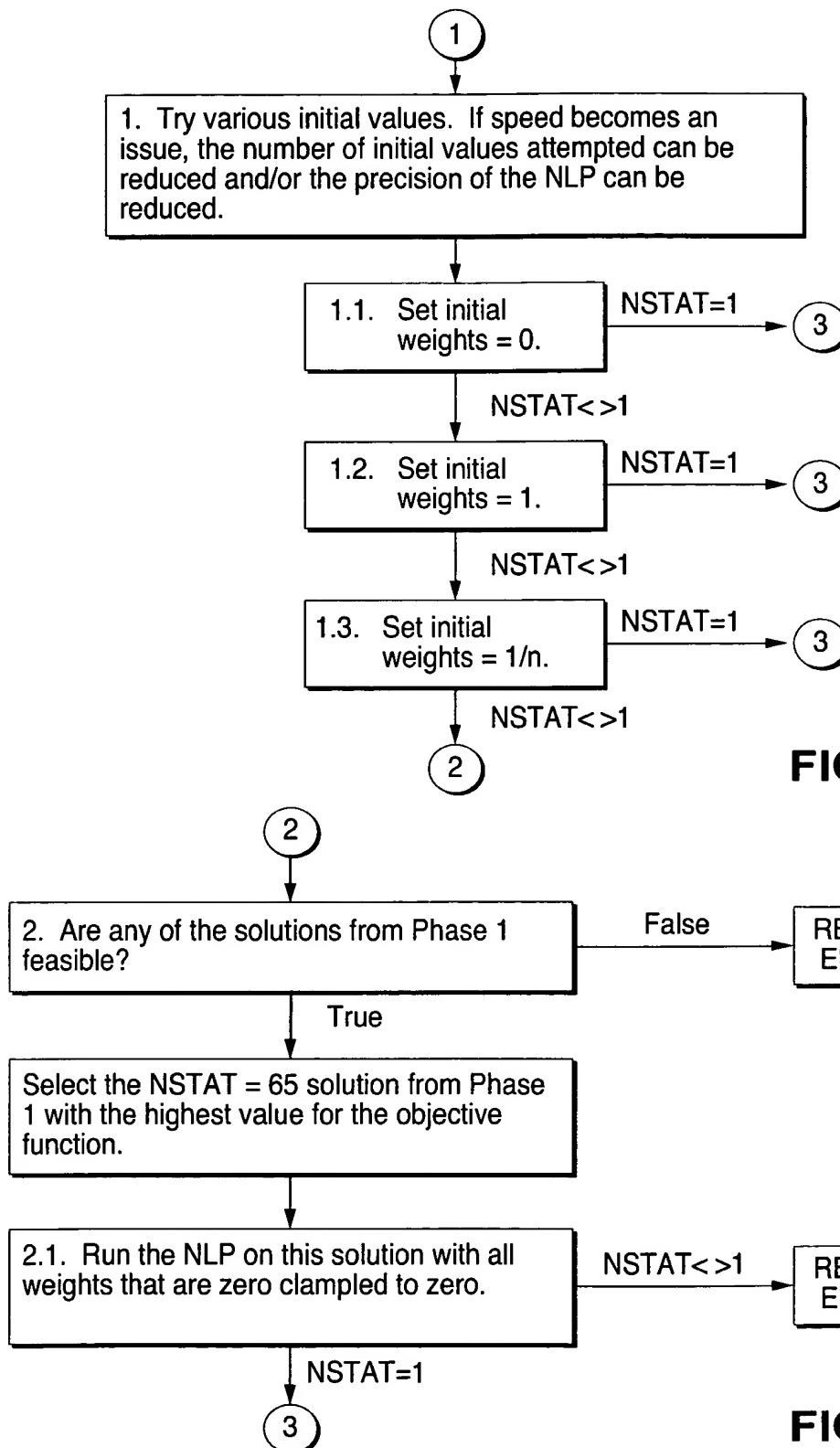


FIG. 5

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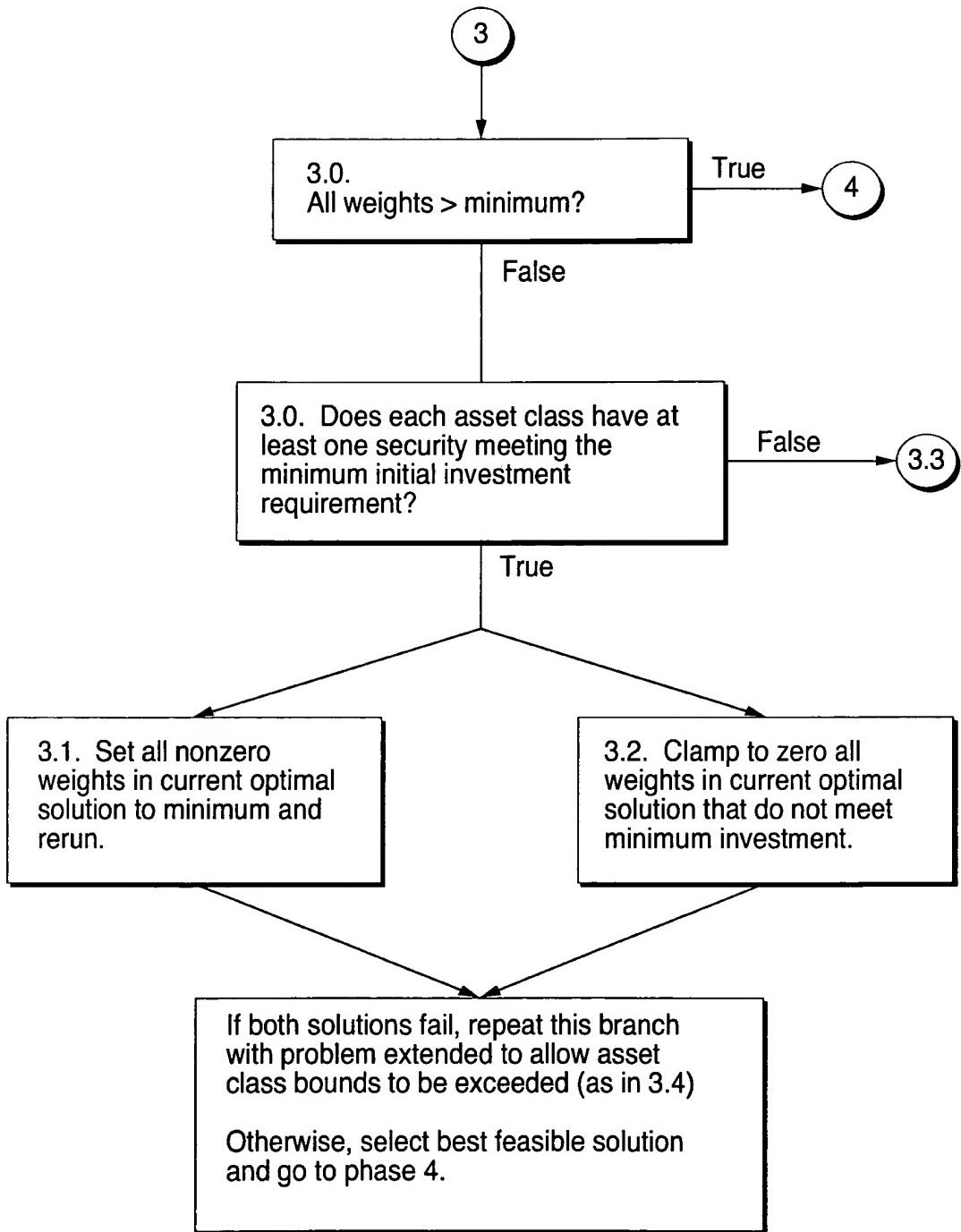


FIG. 8A

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3.3

At this point a solution has been identified where at least one asset class has zero securities meeting the minimum investment requirement. Proceed as follows:

For asset classes with at least one security meeting its minimum requirement, include all securities meeting the min, and limit their lower bound to the min. For all assets in these classes not meeting the min, set the upper bound to zero.

For asset classes with no securities meeting the min, identify the security with the largest weight and set its lower bound to the min investment.

Solve the redefined NLP.

NSTAT=1

4

NSTAT<>1

3.4

For each asset class (excluding "other"), add two variables representing positive and negative deviations (both will take on positive values between 0 and 1). Thus in the current formulation, add 12 variables to the basic problem. In addition to using these to force the lhs to meet the rhs of the asset class constraints, they are appended to the objective function with a penalty determined by the fixed parameter Gamma (currently set to 100). Thus, the sum of deviations is minimized. Note that negative deviations from the cash target are currently penalized at 2x. At some point, we should specify what the maximum allowable deviations for each asset class.

Solve the redefined NLP.

NSTAT=1

4

NSTAT<>1

REPORT ERROR

FIG. 8B

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4

At this point an optimal solution has been identified from the NLP. This cleanup phase will make the transformations necessary to link the results with the final user interface.

REPORT ERROR

There are three identifiable cases to be addressed where a solution can not be reported to the user:

- 1) The NLP can not solve due to the lack of funds--it is possible, a priori, to determine when there is not a feasible solution due to the fund minimums and how the discretionary funds are allocated across the tax/nontax accounts. A reporting mechanism should be designed to account for this case. An alternate to consider is that for these cases we recommend an asset allocation fund appropriate for the user's risk tolerance, such as the Schwab MarketTrack funds.
- 2) The NLP does not indicate a solution in any phase before the minimum investment criteria are considered--we do not anticipate that this will occur, given the robustness of the iterative solution method, but it cannot be ruled out. Thus an error reporting mechanism must provide for the case where the NLP just does not work.
- 3) There are situations in phase 3 where it is possible for the NLP to fail. although the flexibility of the 3.4 technique should preclude most all of these, an error is still possible. We need an error reporting mechanism for this possibility. in these cases, however, we may be able to modify the solution approach to resolve the error.

The error reporting system will include a log file where the step at which the solution failed is identified. This will help us identify errors where a change to the algorithm can be made to avoid similar errors in the future.

FIG. 9